

ANNALES ZOOLOGICI

Tom XVII

Warszawa, 25 VIII 1958

Nr 7

Ryszard BIELAWSKI

Rewizja rodzaju *Anisosticta* DUPONCH. wraz z opisem nowego gatunku z Syberii (*Coleoptera*, *Coccinellidae*)

Ревизия рода *Anisosticta* DUPONCH. с описанием нового вида из Сибири (*Coleoptera*, *Coccinellidae*)

A revision of the genus *Anisosticta* DUPONCH., with description of a new species from Siberia (*Coleoptera*, *Coccinellidae*)

[With 30 text-figures]

The genus *Anisosticta* DUPONCH. belongs to the tribe *Hippodamiini* and includes six species, discussed below, which inhabit the Holarctic Region.

On evidence of the structure of the copulatory organ of *Anisosticta novemdecimpunctata* (L.), DOBZHANSKY, 1927, stated that the genus *Anisosticta* DUPONCH. is closely related to the genus *Coccinula* DOBZH., and by the toothless claws, to the genus *Bulaea* MULS., MADER, 1928; he referred the genus in question to the tribe *Coccinellini* and set up a separate group of genera for it. KORSCHESKY, 1932, did not admit that the tribe *Hippodamiini* is distinct and put the genus *Anisosticta* DUPONCH. in the *Coccinellini*, thereby placing it close to *Adalioopsis* CAPRA and *Aages* BAROVSKY.

It seems to me that the genus *Anisosticta* DUPONCH. is closer to the genera *Adonia* MULS. and *Hippodamia* MULS., and, owing to the peculiar structure of the male genitalia of *Anisosticta sibirica* sp. n., also to the genus *Aphidecta* Ws.

In this paper I made use of material in the possession of the following institutions: the British Museum (Natural History) in London; the Deutsches Entomologisches Institut in Berlin; Institute of Zoology of the Polish Academy of Sciences in Warszawa; Magyar Nemzeti Múzeum Állattára in Budapest; United States National Museum in Washington and University of Kansas, Department of Entomology, Lawrence, Kansas. For making these materials available my thanks are due to Dr. E. B. BRITTON of London, Dr. W. J. HANSON of Lawrence, Kans., Dr. Z. KASZAB of Budapest, Dr. R. KELLOG of Washington and Professor H. SACHTLEBEN of Berlin. I also used material which was kindly supplied by Professor Michio CHÛJÔ of Takamatsu-shi, Japan. I also gratefully acknowledge the advice I received from Mr. M. MROCZKOWSKI, Head of the Coleopterological Laboratory of the Institute of Zoology of the Polish Academy of Sciences.

Anisosticta sibirica sp. n.

General distribution: Siberia.

Holotype. Male. Shape of body: elongated, oval, slightly convex. Head with pale yellow mouth appendages and antennae. On the upper side of the base of the head two black spots touching the lateral margins of the eyes. The punctures on the head very shallow and indistinct. The spaces between the punctures with a distinct reticular microsculpture. Antennae 11-jointed. The first two joints thickened; the following three of almost uniform length. The last four joints expanded, forming a club. Width of the pronotum less than that of the base of the elytra. Pronotum widest about the middle of its length. Lateral margins distinctly reflexed. Base not marginate. Punctures on the pronotum more distinct and deeper than on the head. The distance between two punctures distinctly more than their diameters. The surfaces between the punctures with a distinct reticular microsculpture. The interspaces of the net almost equilateral. Pronotum yellow with six large spots: two spots on the sides of the pronotum, equidistant from the lateral, anterior and posterior margins; two spots at the centre of the pronotum; two others at the base over the scutellum. Scutellum

triangular, of a width slightly exceeding its length; dark brown. Lateral margins of the elytra mostly widely reflexed. The reflexed part of the margins tapering evenly to the end. The posterior one-third of the elytra having no reflexed margins.



Fig. 1-6.

Fig. 1-3 — *Anisosticta sibirica* sp. n. (fig. 1 — holotype); fig. 4 — *A. kobensis* LEW.; fig. 5 — *A. novemdecimpunctata* (L.); fig. 6 — *A. strigata* (THUNBG.).

On the reflexed elytral margins, a sequence of punctures distinctly larger than those on the remaining part of the elytra. Elytra with single punctures and only at the centre near the suture showing a few additional smaller punctures. The distance between two punctures less than their diameters. The surface between the punctures smooth, devoid of any microsculpture. Occasionally, near some of the punctures, are traces of a microsculpture in the form of small faintly visible lines.

Elytra yellow with nine black spots on each and a common one below the scutellum which is distally somewhat divided [Fig. 1]. The nine spots distributed on the elytra in the same way as in the typical form of *Anisosticta novemdecimpunctata* (L.). All fairly large, almost identical in size, round and irregular in outline. The fourth spot not oblong. Base of the head yellow underneath with black margins and a black spot at the middle. The reflexed sides of the pronotum and elytra yellow. Anterior two-thirds of the prosternum whitish yellow over the entire width, the same coloration extending also in part on to the prosternal process. The black coloration of the prosternum reaching to its lateral margins. Mesosternum white-yellow at the centre. Mesoepisternum yellow-white at the margin near the epimeron. Mesoepimera white. Metasternum with a white-yellow bipartite spot, its two parts diverging obliquely towards the lateral margins. Metaepisterna almost entirely white except for the brown anterior margin at the mesoepimeron. Metaepimera whitish yellow. Femoral line on the first abdominal sternite not reaching to its anterior margin; its bend extending slightly beyond the middle of the length of the sternite. Sternites of the abdomen black except for the yellow, lateral margins of the first five sternites. Sternite sixth yellow, infuscated at the margin proximate to the black part of fifth sternite. Posterior margin of sixth sternite broadly truncate. Legs brown-yellow. Tarsal claws straight, without additional teeth.

Genital armature [Figs. 7—8]. Siphon with a well developed siphonal capsule. Also notably bent backwards terminally. Penis forked up to one-third of its length [Fig. 7]. Penis and parameres of equal length. Laterally the penis slender and terminally acute [Fig. 8]. Subterminal, when viewed from the side of the parameres, notch forming a retrorse hook. Parameres appreciably bent in from the side of the penis. Hairs on the parameres long. Basal part of the genital armature moderately large.

Allotype. Female. Upper surface of body as in the holotype. Basis of the head black underneath. Prosternum whitish-yellow only in the middle and before the process. The whitish-yellow coloration not extending to the lateral margins of the

prosternum. The whole meso- and metasternum unicolorous. The anterior margin of the metaepisternum more broadly infuscate than in the holotype. Sternites of the abdomen similar in coloration as in the holotype except that the posterior

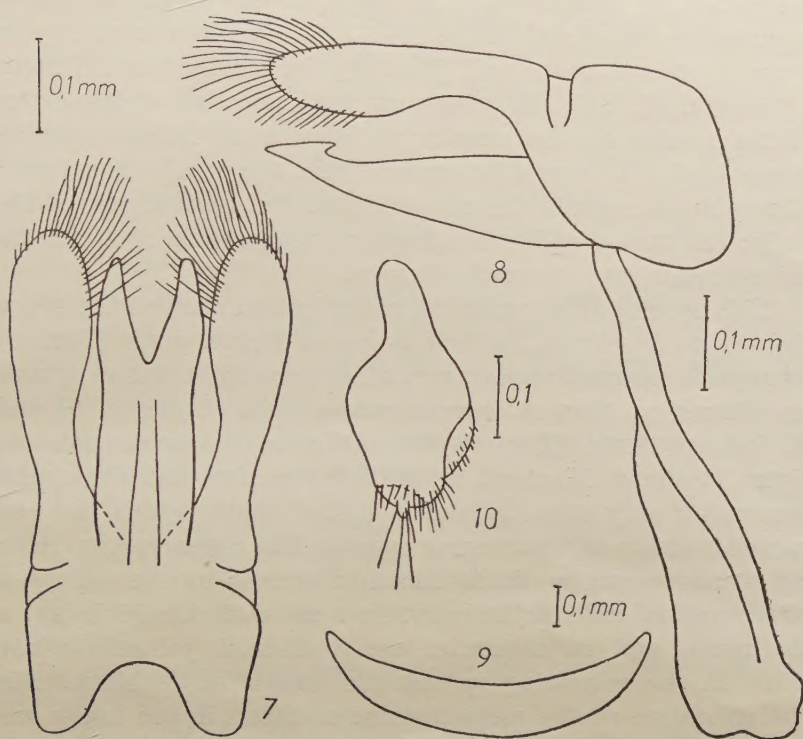


Fig. 7-10 — *Anisosticta sibirica* sp. n.

Fig. 7, 8 — male genitalia; fig. 9 — sixth abdominal sternite of female; fig. 10 — genital plate; (holotype and allotype).

margin of each is slightly lighter at the middle of the width. No trace of any notch on sixth sternite of the abdomen [Fig. 9]. Genital plate as on Fig. 10.

Holotype: „Dauria, 1869” (Transbaikalia).

Allotype: „Eastern Siberia”.

Paratypes: „Dauria, 1869” — 3 females, and „Eastern Siberia” — 1 male.

The holotype, allotype and all paratypes are kept at the Institute of Zoology of the Polish Academy of Sciences, Warszawa.

The variability noted in the paratypes involves mainly coloration. The black spots on the basis of the head may be merged. The spots on the pronotum may be larger or somewhat smaller than in the holotype; in one of the paratypes they merge almost completely. The spots on the elytra are either separate or connected [Figs. 1–3]. In one of the paratypes spots 4+5 are connected [Fig. 2], in another one 1/2+3, 4+5 [Fig. 3]. This indicates that the coloration of the elytra of the species can be equally variable as in *A. novemdecimpunctata* (L.). It should be stressed that the species is sexually dimorphic as regards the coloration of the ventral side of the body: the males, unlike the females, have a pale spot on the mesosternum and the metasternum.

This species differs from all other known ones of the genus *Anisosticta* DUPONCH. in that it has a forked penis [Fig. 7]. As regards external appearance, *A. sibirica* sp. n. shows almost no differences from *A. novemdecimpunctata* (L.) [Fig. 5] and *A. kobensis* LEW. [Fig. 4]. Coloration of the pronotum and elytra is almost identical in all three species, the differences concerning only the size and shape of spots, which are also variable within the particular species. The three species referred to above can be distinguished externally by the coloration of the ventral side of the body. In a male of *A. sibirica* sp. n. the meso- and metasternum are a distinct yellowish-white, while in the remaining species the coloration is black. Also the coloration of the metaepisternum differs in the males and females. In addition, *A. sibirica* sp. n. is distinct from *A. kobensis* LEW. because the females of the latter species have a deep notch [Fig. 13] in the sixth sternite of the abdomen and the former species has none [Fig. 9]. This same characteristic also distinguishes *A. sibirica* sp. n. from *A. novemdecimpunctata* (L.) [Fig. 16]. Differences between the species in question and *A. strigata* (THUNBG.) concern coloration of the abdominal sternites and pattern on the elytra.

***Anisosticta kobensis* LEWIS**

General distribution: Japan, China.

This species was described in 1896 by LEWIS from Japan. The description is extraordinarily brief. Comparing *A. kobensis*

LEW. and *A. novemdecimpunctata* (L.), LEWIS stated that the former species differs by having a brighter background, larger spots, more distinct and larger punctures on the elytra and a more slender outline of the body. KURISAKI reported in 1924 that the male of *A. kobensis* LEW. has a concavity on the last (sixth) sternite of the abdomen. Existing information about the morphology of the species in question is restricted to the data referred to above. *A. kobensis* LEW. is quoted in various catalogues: by WINKLER, 1927, KORSCHESKY, 1932, MIWA and YOSHIDA, 1935, as a separate species. Owing to slight differences between *A. novemdecimpunctata* (L.) and *A. kobensis* LEW., MADER, 1929, suggested that the latter is not a separate species.

The specimens I examined, which were kindly sent by Professor M. CHÛJÔ and are kept at the Institute of Zoology of the Polish Academy of Sciences in Warszawa, came from the following localities:

Japan, Honshu, Hyoko Pref., Hyotan-ike, Takarazuka, 21 IV 1949, coll. S. UENO, 2 males and 2 females.

I also had the opportunity of examining the following specimens borrowed from the U. S. National Museum, Washington:

1. China, Tientsin, 15 IV 1928, H. T. FENG — 2 specimens.

2. China, Peking, 1925–1929, C. F. WU — 9 specimens.

3. China, Nanking, Kiangsu prov., 15 VIII 1919, H. F. LOOMIS — 1 specimen.

I also examined the paratype kindly lent by the British Museum (Natural History):

Japan, Tokyo-Honju. Paratype, 1 male.

The differences between *A. novemdecimpunctata* (L.) and *A. kobensis* LEW. quoted by LEWIS, 1896, are in general agreement with the characters I observed in the specimens examined. The size of the spots on the elytra of all specimens from Japan and China [Fig. 4] is less than in the European specimens of *A. novemdecimpunctata* (L.) [Fig. 5]. The spots on the pronotum are also smaller, particularly those adjacent to the lateral margins. The spots on the elytra of paratype of *A. kobensis* LEW. from Tokyo-Honju are not distinct. It has only slightly visible spots 1, 3, 7, 8 which are of very light brownish coloration. The spots on the pronotum are black and distinct. This is probably an immature specimen, the

remaining part of its body being nevertheless normally coloured and its genital armature being notably sclerotized.

In addition to the differences reported by LEWIS, 1896, *A. kobensis* LEW. and *A. novemdecimpunctata* (L.) also show differences in the coloration of the ventral side of the body. The coloration of the prosternum varies in *A. novemdecimpunctata* (L.). It may be whitish-yellow almost all over, the coloration extending even over the prosternal process. In *A. kobensis* LEW. the whitish-yellow coloration extends over the length of the prosternum and reaches to the anterior margin. Lateral margins of the prosternum are in both species invariably whitish-yellow. Mesoepisterna are in *A. novemdecimpunctata* (L.) invariably black while in *A. kobensis* LEW. they are usually more or less paler at the mesoepimeron. Metaepisternum is in *A. novemdecimpunctata* (L.) black except for the whitish-yellow part adjacent to the metaepimeron. The metaepisternum is in *A. kobensis* LEW. whitish-yellow beginning at the middle of its length. The border line between the black and the white coloration is indistinct and runs obliquely. The abdominal sternites are in *A. kobensis* LEW. of a paler coloration than in the remaining species of the genus *Anisosticta* DUPONCH. Lateral and posterior margins of the fourth sternite, as well as the fifth and sixth, are yellow-brownish. There is a narrow, transverse infuscation on the anterior margin of the fifth sternite. In one of the specimens, a female, the first and second abdominal sternites and the anterior margin of the third sternite are black while the remaining sternites are a yellow-white all over, unlike in all the remaining species.

The deep notch on the sixth abdominal sternite of the males of *A. kobensis* LEW. reported by KURISAKI, 1924, actually concerns females of this species. This notch, which is wide with parallel sides and which terminates in a regular semi-circular arch extending beyond half the length of the sternite, is a characteristic feature of the females of the species in question [Fig. 13]. In *A. novemdecimpunctata* (L.), on the other hand, the notch does not reach to the middle of the sternite's length, and its edges converge at almost a right angle [Fig. 16]; in *A. strigata* (TUNBG.) it is not very deep [Fig. 29].

Male genital armature [Figs. 11 and 12]. Hairs on the parameres in *A. kobensis* LEW. long. Subapically the hair-cover is interrupted [Fig. 12]. In *A. novemdecimpunctata* (L.) there are few hairs on the parameres, and they are very short. The hair-cover is interrupted similarly as in *A. kobensis* LEW. [Fig. 15]. Seen from side, the penis doesn't show the unciform retroflexion [Fig. 12] that is found in *A. novemdecimpunctata*

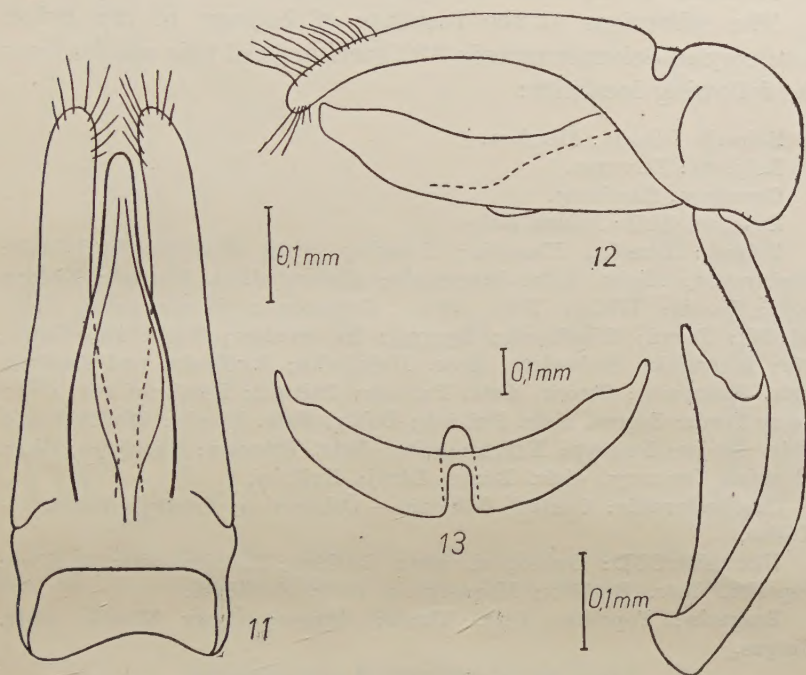


Fig. 11-13 — *Anisosticta kobensis* LEW.

Fig. 11, 12 — male genitalia (paratype); fig. 13 — sixth abdominal sternite of female.

(L.) [Fig. 15] and in *A. sibirica* sp. n. [Fig. 8]. When viewed from the side of parameres at the middle of its length the penis of *A. kobensis* LEW. is bent in, thus directed towards the parameres. In *A. novemdecimpunctata* (L.) there is, rather, a tendency towards the development of a mild bulge in the margin facing the parameres [Fig. 15].

The characters referred to above supplement the description of *A. kobensis* LEW. They confirm that the species is distinct, and they are indicative of its close relation to *A. novemdecimpunctata* (L.).

***Anisosticta novemdecimpunctata* (L.)**

General distribution: Europe, Siberia.

The collections of the Institute of Zoology of the Polish Academy of Sciences include 392 specimens of this species from the following localities:

Balearic Islands : Albufera.

Belgium : Tervuren.

Germany : Hamburg.

Estonian SSR : Peipus Lake.

Poland : Szczecin; Koszalin; Drawiny, distr. Strzelce Krajeńskie; Międzychód; Miały, distr. Szamotuły; Kiekrz, distr. Poznań; Zielona Góra; Konin; Wielka Wieś, distr. Wejherowo; Westerplatte, distr. Gdańsk; Toruń; Włocławek; Łeczyca; Inowrocław; Augustów; Hawa; Elk; Białystok; Białowieża, distr. Hajnówka; Rybienko nad Bugiem, distr. Radzymin; Seroek, distr. Pułtusk; Pułtusk; Pomiechówek, distr. Nowy Dwór; Zegrze, distr. Pułtusk; Debły, distr. Błonie; Warka Stara, distr. Grójec; Puławy; Krzyżanowice, distr. Pińczów; Skorocice, distr. Pińczów; Oweżary, distr. Busko Zdrój; Kraków.

Czechoslovakia: Central Bohemia — Čelakovice; Central Slovakia — Košice.

Ukrainian SSR : Dvinograd, distr. Borščev; Melnica, distr. Borščev; Suparka, distr. Borščev; Monastyrok, distr. Zališchyki.

Bulgaria : Topolite, distr. Varna; Burgas; Černy Wrech, distr. Burgas.

The following two specimens of *A. novemdecimpunctata* ab. *egena* Ws., borrowed from the U. S. National Museum of Washington, have been investigated too:

1. Mikhailovskoye, Taschkent.
2. Samarkand.

Anisosticta novemdecimpunctata (L.) forma typica, fig. 5. Male genital armature, figs. 14 and 15. Sixth abdominal sternite of female, fig. 16.

This species which is commonly found in Poland, occurs on *Phragmites communis* TRIN. During my visit to Bulgaria,

in autumn, 1954, I found this species living on oak (*Quercus* L. sp.). Specimens from Bulgaria differ somewhat from those from Poland, by having the ground of the pronotum and elytra paler and the spots on the elytra somewhat smaller.

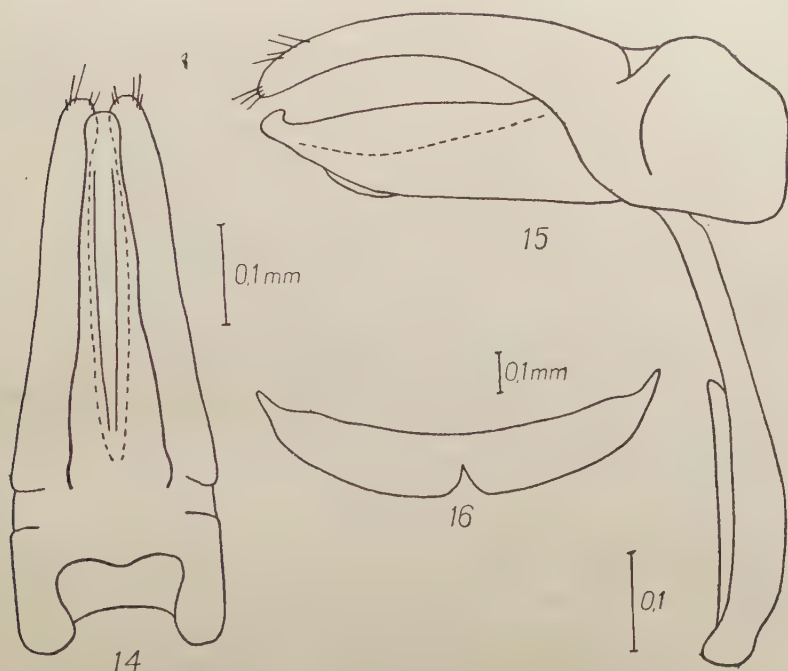


Fig. 14—16 — *Anisosticta novemdecimpunctata* (L.).

Fig. 14, 15 — male genitalia; fig. 16 — sixth abdominal sternite of female.

***Anisosticta bitriangularis* (SAY)**

Synonyms: *Coccinella multiguttata* RANDALL, 1838.

Anisosticta novemdecimpunctata ab. *irregularis* WEISE, 1879.

General distribution: North America, Siberia.

The species was described from North America in 1824 after specimens with separate spots on the elytra and was originally placed in the genus *Coccinella* L. It was again described in 1838 by RANDALL after specimens with elytral spots connected in various ways. LECONTE synonymised these

two names in 1859. In 1873, CROTCH recognized the two names as synonyms of the earlier described *A. strigata* (THUNBG.).

In 1879, WEISE described the variety *A. novemdecimpunctata* ab. *irregularis* WS. after two specimens from Oregon. However, in 1885, he synonymised it with *A. multiguttata* (RAND.), which he considered a separate species. Next, in 1894, SNYDER, HARRINGTON, WICKHAM, using the synonymy set up by CROTCH, quoted new data on the distribution of *Anisosticta strigata* (THUNBG.) in North America. In 1895, on evidence of specimens from Illinois, WEISE defined *Coccinella multiguttata* RAND. as a variety of *A. novemdecimpunctata* (L.).

As a result of further investigations it became a generally accepted view (KORSCHESKY, 1932) that *A. novemdecimpunctata* (L.) appears in North America as ab. *irregularis* WS., and *A. strigata* (THUNBG.), as ab. *bitriangularis* (SAY) and ab. *multiguttata* (RAND.).

Only MADER, 1935, synonymised *A. novemdecimpunctata* ab. *irregularis* WS. with *A. strigata* ab. *bitriangularis* (SAY), thus deleting *A. novemdecimpunctata* (L.) from the fauna of North America.

TIMBERLAKE, 1947, describing *A. borealis* TIMB. from Alaska, compared it with *A. bitriangularis* (SAY), which infers that he treated *A. bitriangularis* (SAY) as a distinct species; he did this without presenting further evidence.

The results of my examinations involving specimens from North America confirm TIMBERLAKE'S view that *A. bitriangularis* (SAY) is a separate species and that the names *A. multiguttata* (RAND.) and *A. novemdecimpunctata* ab. *irregularis* WS. are merely synonyms.

The geographical distribution of *A. bitriangularis* (SAY) is not restricted merely to North America but also extends over Eastern Siberia. The collection of the Institute of Zoology of the Polish Academy of Sciences in Warszawa includes one male specimen from Transbaikalia — Chita, Hermann Frieb., and the collection of the U. S. National Museum in Washington, four specimens labelled as follows:

1. Turan, Baikal — 1 specimen.
2. Werchne-Udinsk, Trsbaikal, Mand. — 2 specimens.
3. Joliette, Canada — 1 specimen.

In addition to these specimens, specimens from North America included in the collections of the Deutsches Entomologisches Institut in Berlin have also been examined:

1. Forks, Mont., 1 VIII 1918, A. L. MELANDER. Labelled *A. irregularis* RAND. Female.
2. Me. [Mexico], C. A. FROST., 22 VII. Labelled by SICARD as *A. irregularis* RAND. Male.
3. Mass., Hopkinton, 18 V 1907, FROST. Labelled by SICARD as *A. irregularis* RAND. Male.
4. Mass., Hopkinton, 18 V 1907, FROST. Labelled as *A. strigata* (THUNBG.). Female.
5. Mass., Sherborn, 13 VIII 1911, C. A. FROST. Labelled by WEISE as *A. strigata* (THUNBG.). Female.

In the collection of the U. S. National Museum in Washington:

1. Melford, Mass., 4 specimens, det. R. KORSCHESKY.
2. Edmonton, Alta., 2 VI 1917, leg. F. S. CARR. 2 specimens.
3. Melville, N. Y., IV 1924, leg. G. M. GREENE. 3 specimens.
4. Long Medw., Mass., 14 V 1905, F. KNAB. 3 specimens.
5. Twin Lake, Minn., 12 V 1935, K. COOPER. 2 specimens.
6. Corvallis, Ore., 2 specimens.
7. Pr. Edw. Co., Ont., 20 V 1921. 3 specimens.
8. Aweme Man., Can., 14 VI 1909, leg. E. CRIDDLE and G. M. GREENE. 2 specimens.
9. College, Alaska, 25 VI 1948. 2 specimens.

In the collection of the University of Kansas, Department of Entomology, Lawrence, Kansas:

1. East Troy, Wis., 10 VIII 1935, P. B. LAWSON, det. C. WINGO 1950. 1 specimen.
2. Mass. [Massachusetts], 1 specimen.
3. Cornwall, Ct., 28 VII 1921, CHAMBERLAIN. 2 specimens.
4. Cheboygan Co., Mich., 2 VII 1935, H. B. HUNGERFORD. 1 specimen.
5. Bath, N. H., 21 VIII 1934, M. E. GRIFFITH. 1 specimen.

Coloration of the dorsal side of the body varies considerably [Figs. 17—22]. Specimens are found that have a pattern resembling that in *A. novemdecimpunctata* (L.), while others resemble *A. strigata* (THUNBG.).

[On the pronotum there are three spots, which may be connected with one another in various ways. The elytra have 9 spots each and a common one at the scutellum. The spots

may be connected in various ways; they may even form a long single spot on the suture and a band on the sides of the elytra. There are variations in the coloration of the elytra analogous to those in *A. novemdecimpunctata* (L.) and in *A. strigata* (THUNBG.) and in other species of the genus.

Pronotum faintly punctate. Distances between the punctures exceed their diameters. The surface between the punc-



Fig. 17—22 — *Anisosticta bitriangularis* (SAY).

tures has a distinct and pronounced microsculpture. Elytra densely punctate with large punctures. Distances between the punctures less than their diameters. The surface between the punctures has no microsculpture except for minute punctures in the vicinity of the larger ones.

On the prosternum only a narrow strip at the anterior margin is white. Mesoepimera are white; in this way the species differs from *A. strigata* (THUNBG.) with its strongly infuscated

mesoepimera. Mesoepisternum uniformly black. Metaepisterna black with on the posterior margin whitish; this distinguishes the species from *A. sibirica* sp. n. and from *A. kobensis* LEW. Metaepimera white.

Sides of sternites one to five and the entire sternite sixth yellow-brown. This character clearly distinguishes the species from

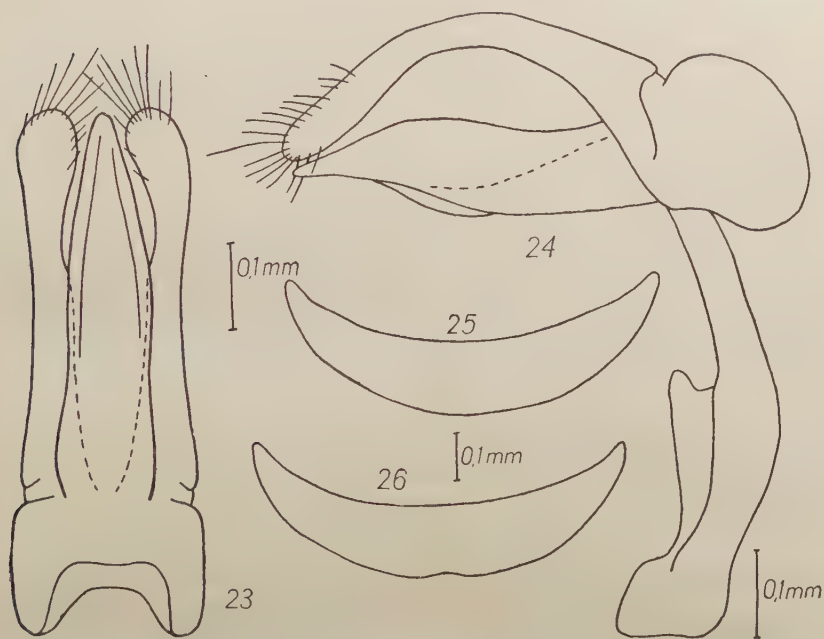


Fig. 23—26 — *Anisosticta bitriangularis* (SAY).

Fig. 23, 24 — male genitalia; fig. 25, 26 — sixth abdominal sternite of female.

A. strigata (THUNBG.), in which the abdominal sternites are black.

A. bitriangularis (SAY) differs from the remaining species of the genus *Anisosticta* DUPONCH. by the structure of the male genital armature [Figs. 23 and 24]. The penis, seen from the side, is slightly bent downward terminally [Fig. 24]. In the specimen from Transbaikalia the flexion is more feeble and the very end of the penis is somewhat more slender. The margin of the penis facing the parameres is bent in at the base and

beginning at one-third its length is flexed towards the parameres. The parameres are notably curved and have fairly long hairs. The hair cover is not interrupted as it is in *A. novemdecimpunctata* (L.) and in *A. kobensis* LEW.

The posterior margin of the sixth abdominal sternite of the female has either no notch at all or a very slight one [Figs. 25 and 26]. This is a feature which distinguishes *A. bitriangularis* (SAY) from *A. novemdecimpunctata* (L.) and *A. kobensis* LEW. in which two species the notch referred to is pronounced [Figs. 13 and 16]. The sexual tubercle on the genital plate is relatively large, but its size is not a constant character of the species in question.

The structure of the sixth abdominal sternite in the females of *A. bitriangularis* (SAY) is intermediate between that observed in *A. sibirica* sp. n. and that in *A. strigata* (THUNBG.). *A. bitriangularis* (SAY) shows some resemblance in the structure of the male genital armature to *A. kobensis* LEW. and in coloration of the ventral side of the body to *A. novemdecimpunctata* (L.).

Anisosticta strigata (THUNBG.)

General distribution: Northern Europe, Siberia, Alaska.

Syn. nov.: *Anisosticta borealis* TIMBERLAKE, 1943

I examined 6 specimens from Lapland (2 specimens from the collection of the Deutsches Entomologisches Institut in Berlin, 4 specimens from the collections of the Institute of Zoology of the Polish Academy of Sciences in Warszawa) and 1 specimen from Finland — Ivalo-Joki, J. SAHLBERG (from the collections of the Magyar Nemzeti Múzeum Állattára in Budapest) as well as 3 specimens from North America in the collection of the U. S. National Museum, Washington, among them one paratype:

1. Anchorage, Alaska, 6 VI 1917, Collector Jas. S. HINE, Paratype 56613 USNM — *Anisosticta borealis* TIMBERLAKE, 1 specimen.
2. Alaska Ins. Project, Anchorage, Alaska, 30 mi NE, 4 VIII 1948, R. J. SAILER, 1 specimen.
3. Reindeer Depot., Mackenzie Delta, 6 VIII 1948, W. J. BROWN, 1 specimen.

In all specimens examined all three spots on the pronotum are connected forming two large spots or only one. On the

elytra there is a large spot on the suture and a band on the sides, spot 8 is connected with the others in neither of the specimens; spot 2 is in four specimens connected with the band and in one it is not [Fig. 6]. In one of the specimens from Alaska all the spots are connected with each other.

Mesoepimera pale brown with darker margins. In one of the specimens at the centre slightly darker brown, and con-

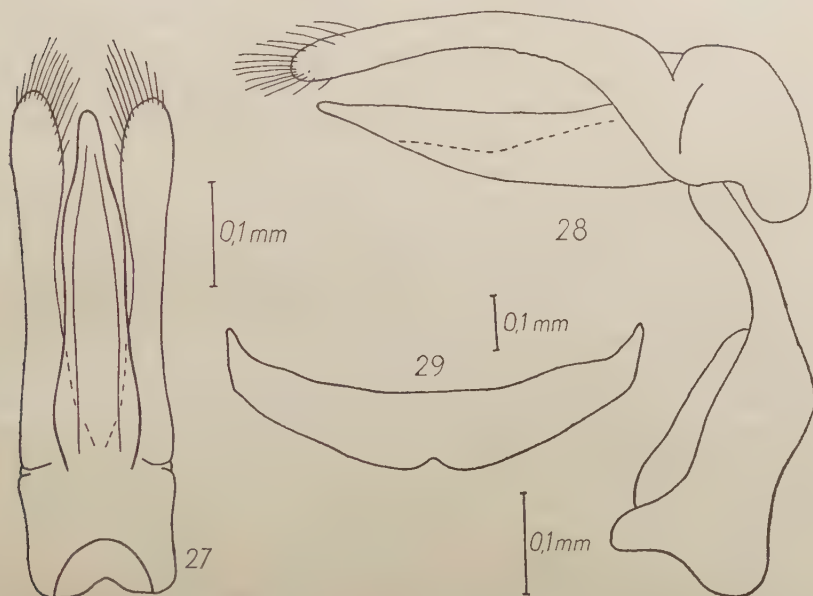


Fig. 27—29 — *Anisosticta strigata* (THUNBG.).

Fig. 27, 28 — male genitalia; fig. 29 — sixth abdominal sternite of female.

sequently the mesoepimera appear, at first glance, black; in the specimens from Alaska the mesoepimera wholly black. Metaepisternum black. Metaepimera yellow-white.

Abdominal sternites black.

Male genital armature as on Figs. 27 and 28. Penis, seen from the side, almost straight, tapering and distally straight and obtuse [Fig. 28]. Parameres regular but very slightly arcuate; distally they have fairly long hairs.

The sixth abdominal sternite of the female with a distinct but slight notch at the middle of the posterior margin [Fig. 29]. Genital plates notably elongated.

Hitherto the species has been reported from France, Silesia, Hungary, Northern Europe, Siberia and North America (KORSCHESKY, 1932). DAUGUET, 1949, challenged reports of the species being in France. The distinctly northern character of the distribution of the species as well as the lack of any specimens from Silesia (in the collections kept in Poland) or from Hungary (in the collections kept in Hungary) and the lack of more precise data in the literature make the presence of the species in Central Europe rather doubtful. Consequently, it may be assumed that *A. strigata* (THUNBG.) is restricted merely to Northern Europe, Siberia and Alaska.

Anisosticta borealis TIMBERLAKE

The three examined specimens from North America, among them one paratype, are extremely similar to *A. strigata* (THUNBG.) when compared with the European specimens. The black colouring of the mesoepimera which is often observed in the American specimens is probably due to individual variability. Both male and female genital armatures are identical with those of *A. strigata* (THUNBG.) from Europe. Therefore, *A. borealis* TIMB. should be considered as a synonym of *A. strigata* (THUNBG.).

* * *

The geographical distribution of the species of the genus *Anisosticta* DUPONCH. includes an area common to most of the species concerned, namely Siberia. This suggests that Siberia is the centre where the species of the genus *Anisosticta* DUPONCH. originated. Thence they probably spread over the areas which they now inhabit.

The morphological characters of the species of the genus *Anisosticta* DUPONCH. which have been examined above indicate the primitiveness of *A. bitriangularis* (SAY). There is a notable variability in the coloration of the dorsal side of the body in this species. In extreme cases, within the limits of variability of the elytra pattern, the spots either are merged into longitudinal bands, or are not connected. The simple structure of the penis, the presence or absence of the notch on the sixth abdominal sternite of the females, the variable size of the sexual tu-

bercle on the genital plates — all this is suggestive of the primitive character of the species.

The species most closely related to *A. bitriangularis* (SAY) is *A. strigata* (THUNBG.). Here the penis is also of a simple structure and there is a slight but inappreciably variable notch on the sixth abdominal sternite of the female. This species is most likely to have developed from *A. bitriangularis* (SAY), or, both species originated from some other common and more primitive species unknown at present.

Another group of more closely related species is formed by *A. novemdecimpunctata* (L.) and *A. kobensis* LEW., which

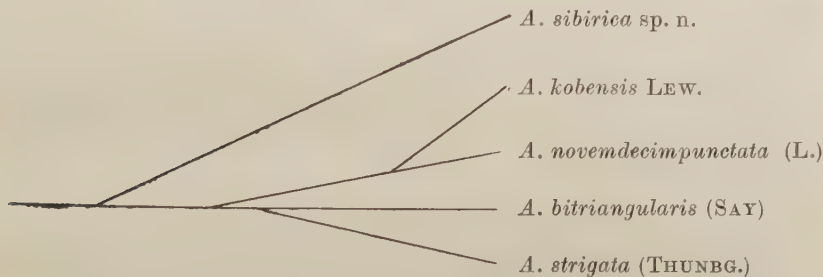


Fig. 30. Diagram of the relations between the species of the genus *Anisosticta* DUPONCH.

resemble each other in the structure of the penis and in the marked notch on the sixth abdominal sternite of the female. The coloration of the metaepimera indicates a certain similarity between the two species and *A. sibirica* sp. n. The character of the distribution of these species indicates that *A. kobensis* LEW. is likely to have developed from *A. novemdecimpunctata* (L.) somewhere in the extreme east of the distribution area of the latter.

A. sibirica sp. n. which differs in the structure of the male genital armature is probably the most specialised species and is not closely related to other species of the genus *Anisosticta* DUPONCH.

A diagram of the relations between the species of the genus *Anisosticta* DUPONCH. is represented on Fig. 30.

Key to the species of the genus *Anisosticta* DUPONCH.

1. Metaepisternum whitish-yellow for half or more than half its surface 2.
- Metaepisternum black or white-yellow only at the end adjacent to the metaepimeron 3.
2. Penis forked [Fig. 7]. Sixth abdominal sternite of female without traces of a notch at the middle of the posterior margin [Fig. 9]. Eastern Siberia *A. sibirica* sp. n.
- Penis simple [Fig. 11]. Sixth abdominal sternite of female with a deep notch at the middle of the posterior margin [Fig. 13]. Japan, China *A. kobensis* LEW.
3. Abdominal sternites black. Northern Europe, Siberia, Alaska *A. strigata* (THUNBG.).
- Abdominal sternites whitish-yellow at the lateral margins 4.
4. Penis curved towards the parameres; hooked terminally [Fig. 15]. At the middle of the posterior margin on the sixth abdominal sternite of the female, a distinct notch ending in a pointed arch [Fig. 16]. Europe, Siberia *A. novemdecimpunctata* (L.).
- Penis curved downwards; not hooked terminally [Fig. 24]. No notch or a very slight and indistinct one on the sixth abdominal sternite of the female [Figs. 25 and 26]. North America, Siberia *A. bitriangularis* (SAY).

BIBLIOGRAPHY CITED

- CROTCH G. R. 1873. Revision of the *Coccinellidae* of the United States. Trans. Amer. Ent. Soc., Philadelphia, **4**, pp. 363—382.
- DAUGUET P. 1949. Les *Coccinellini* de France. Editions de L'Entomologiste, Paris, **46** pp., 40 tt.
- DOBZHANSKY Th. 1927. Über die Morphologie und systematische Stellung einiger Gattungen der *Coccinellidae* (tribus *Hippodamiina*). Zool. Anz., Leipzig, **69**, pp. 200—208, 13 ff.
- HARRINGTON H. W. 1894. An entomological trip to Copper Cliff, Ont. Canad. Entomol., London, **26**, No. 1, pp. 9—16.
- KORSCHESKY R. 1932. *Coccinellidae* II. In: JUNK W. „Coleopterorum Catalogus”, pars 120, Berlin, pp. 225—659.
- KURISAKI M. 1924. On the number of the abdominal segments and the external differences between female and male of *Coccinellids*. Trans. Sapporo nat. Hist. Soc., Sapporo, **9**, pp. 141—147, t. 4.
- LE CONTE J. M. 1859. In: SAY Th. „A description of the Insects of North America”. Amer. Entomol., London, **1**, XXIV+412 pp., 54 tt.

- LEWIS G. 1896. On the *Coccinellidae* of Japan. Ann. Mag. Nat. Hist., London, 6 series, 17, No. 97, pp. 22—41.
- MADER L. 1928 (1926—1937). Evidenz der paläarktischen Coccinelliden und ihrer Aberrationen. I Teil. Wien, pp. 49—76 (412+XII pp., 64 tt.).
- MADER L. 1929 (1926—1937). Evidenz der paläarktischen Coccinelliden und ihrer Aberrationen. I Teil. Wien, pp. 77—92.
- MADER L. 1935 (1926—1937). Evidenz der paläarktischen Coccinelliden und ihrer Aberrationen. I Teil. Wien, pp. 337—372.
- MIWA Y., YOSHIDA T. 1935. Catalogue of Japanese Insects. Fasc. IX. Col. *Coccinellidae*. Ent. World., Tokyo, 3, No. 22, pp. 31—53.
- RANDAL J. W. 1838. Descriptions of new species of Coleopterous Insects inhabiting the state of Massachusetts. Boston J. nat. Hist., Boston, 2, No. 1, pp. 34—52.
- SAY Th. 1824. Narrative of an expedition to the source of St. Peter's River, Lake Winnepeck, Lake of the Woods, 1823, under the command of Stephen H. LONG. 2, pp. 268—378 (after Amer. Entomol., London, 1, 1859).
- SNYDER W. E. 1894. *Coccinellidae* of Dodge Co., Wisconsin. Canad. Entomol., London, 26, No. 3, pp. 87—88.
- TIMBERLAKE P. H. 1943. The *Coccinellidae* or Ladybeetles of the Koebele Collection — Part I. Bull. Exp. Sta. Hawaiian Sug. Pl. Ass., Honolulu, Ent. Ser., No. 22, 67 pp., 2 tt.
- WEISE J. 1879. Bestimmungs-Tabellen der europäischen Coleopteren. II. *Coccinellidae*. Z. Ent., Breslau, N. Folge, 7, pp. 88—159.
- WEISE J. 1885. Bestimmungs-Tabellen der europäischen Coleopteren. II. *Coccinellidae*. Mit Berücksichtigung der Arten aus dem nördlichen Asien. Mödling, 2 Aufl., 83 pp.
- WEISE J. 1895. Neue Coccinelliden sowie Bemerkungen zu bekannten Arten. Ann. Soc. ent. Belg., Bruxelles, 1895, pp. 120—146.
- WICKHAM H. F. 1894. The Coleoptera of Canada. V. The *Coccinellidae* of Ontario and Quebec. Canad. Entomol., London, 26, No. 11, pp. 297—306, ff. 35—52.
- WINKLER A. 1927. Catalogus Coleopterorum regionis palaearcticae. *Coccinellidae*. Wien, pp. 759—790.

STRESZCZENIE

W niniejszej pracy, będącej rewizją gatunków z rodzaju *Anisosticta* DUPONCH., autor stwierdza, że *A. kobensis* LEW. jest odrębnym gatunkiem, zbliżonym do *A. novemdecimpunctata* (L.). Następnie podany jest opis nowego gatunku, *A. sibirica* sp. n. z Syberii, który odróżnia się od wszystkich pozostałych znanych dotychczas gatunków tego rodzaju odmienną budową

aparatu kopulacyjnego samca. Następnie autor wykazuje, że występujący na obszarze Ameryki Północnej *A. bitriangularis* (SAY) jest odrębnym gatunkiem, a nie odmianą *A. strigata* (THUNBG.), jak to dotychczas uważano, oraz stwierdza, że gatunek ten występuje również na Syberii. Podaje również *A. kobensis* LEW. z Chin. Na podstawie zbadanych okazów z Alaski, w tym paratypu *A. borealis* TIMB., autor dochodzi do wniosku, że nie różnią się one od *A. strigata* (THUNBG.); na tej zasadzie autor synonimizuje *A. borealis* TIMB. z *A. strigata* (THUNBG.). Autor wysuwa przypuszczenie, że ośrodkiem pochodzenia gatunków z rodzaju *Anisosticta* DUPONCH. jest Syberia, a najbardziej pierwotnym ze znanych obecnie gatunków jest *A. bitriangularis* (SAY). W zakończeniu pracy autor podaje klucz do oznaczania wszystkich znanych gatunków z rodzaju *Anisosticta* DUPONCH.

РЕЗЮМЕ

Настоящая работа является ревизией видов рода *Anisosticta* DUPONCH. Автор находит, что *A. kobensis* LEW. является самостоятельным видом, близким к *A. novemdecimpunctata* (L.). Далее автор дает описание нового вида *A. sibirica* sp. n. из Сибири, который отличается от всех известных до сих пор видов этого рода строением копуляционного аппарата самца. Кроме того автор выясняет, что встречающаяся в Северной Америке *A. bitriangularis* (SAY) является отдельным видом, а не разновидностью *A. strigata* (THUNBG.) как до сих пор считалось, и констатирует, что этот вид встречается тоже с Сибири. Автор обнаруживает тоже *A. kobensis* LEW. из Китая.

На основании исследованных экземпляров из Аляски, в том паратипа *A. borealis* TIMB., автор приходит к выводу что они не отличаются от *A. strigata* (THUNBG.), и на этом основании автор считает *A. borealis* TIMB. синонимом *A. strigata* (THUNBG.) Автор предполагает, что центром происхождения видов рода *Anisosticta* DUPONCH. является Сибирь, а самым примитивным из исследованных до сих пор видов *A. bitriangularis* (SAY). В заключении автор дает определитель всех известных видов рода *Anisosticta* DUPONCH.

Redaktor pracy – prof. dr J. Nast

Państwowe Wydawnictwo Naukowe – Warszawa 1958

Nakład 1600+150 egz. Ark. wyd. 1,5, druk. 1,5. Papier ilustrac. kl. III 80 g B1

Cena zł 10,– Nr zam. 47/58

Wrocławska Drukarnia Naukowa

